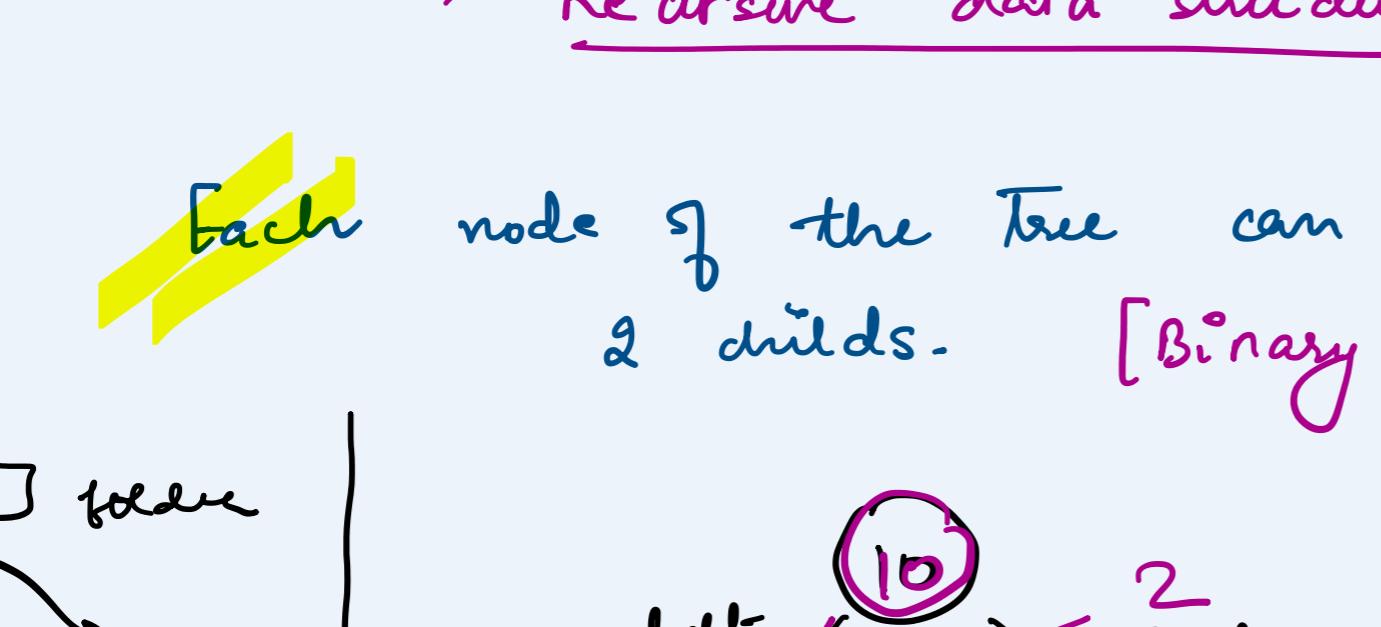
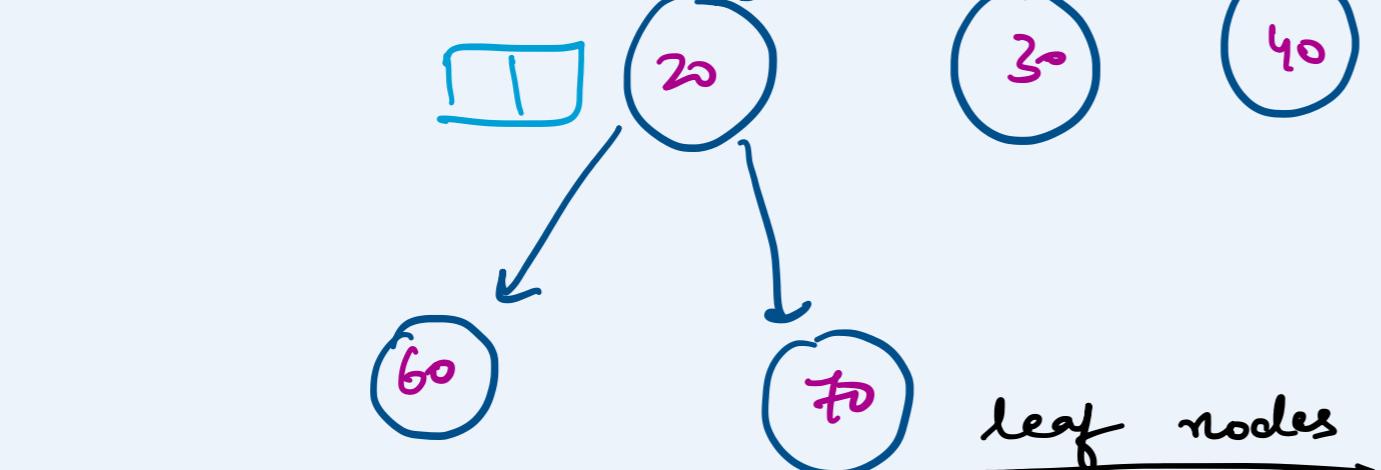
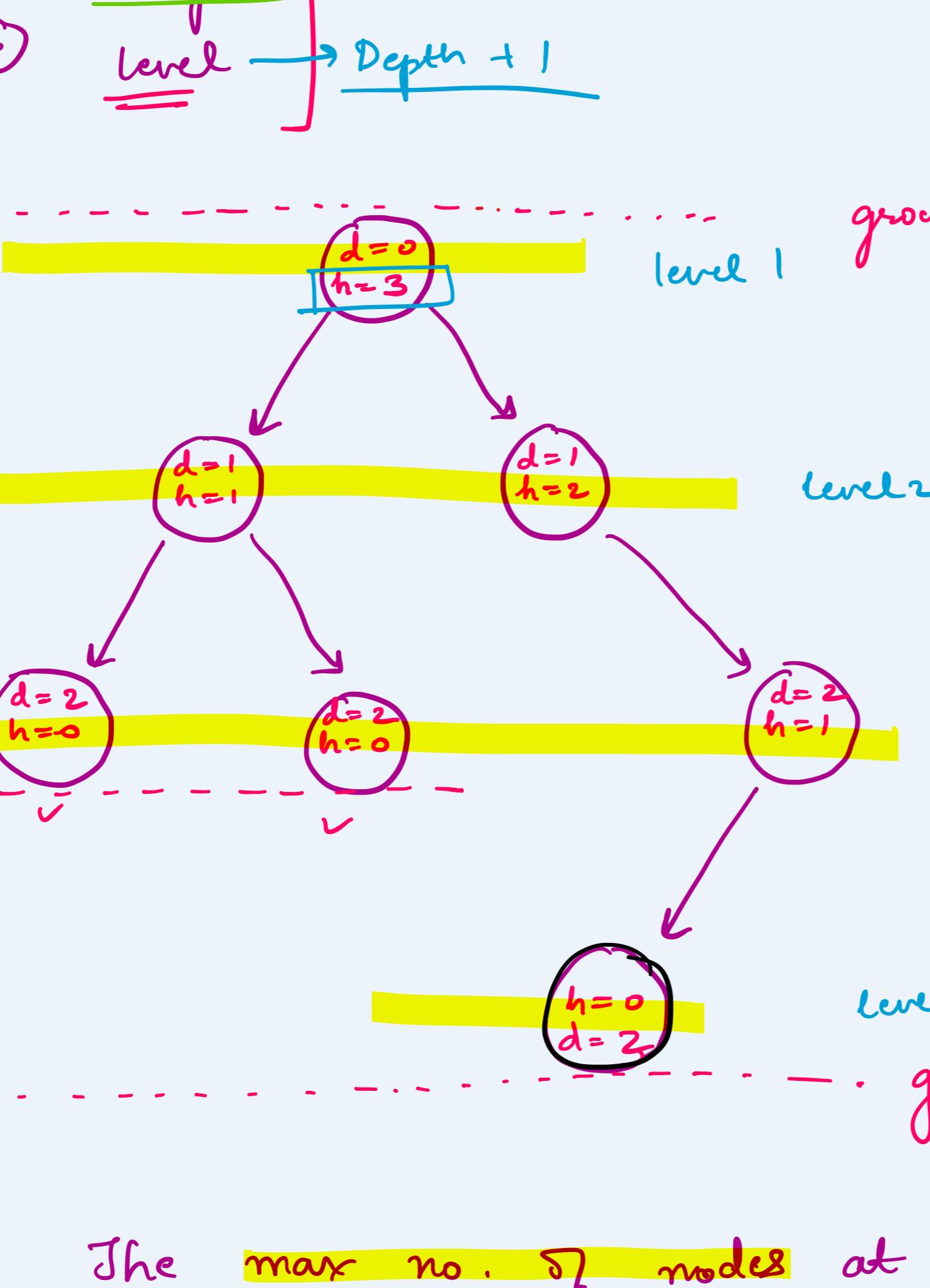
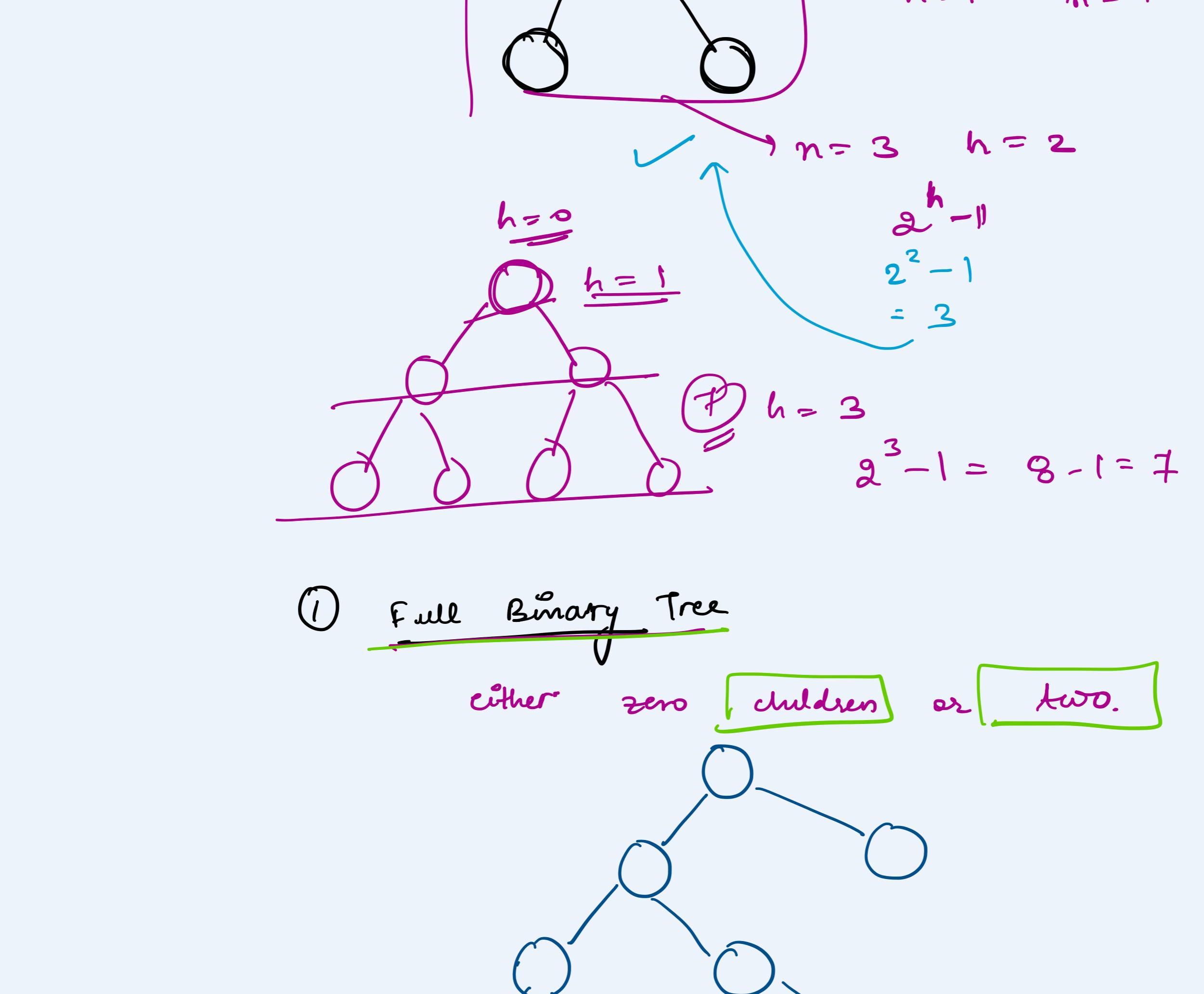


→ Linkedlist→ Stacks→ QueuesHierarchical data structure

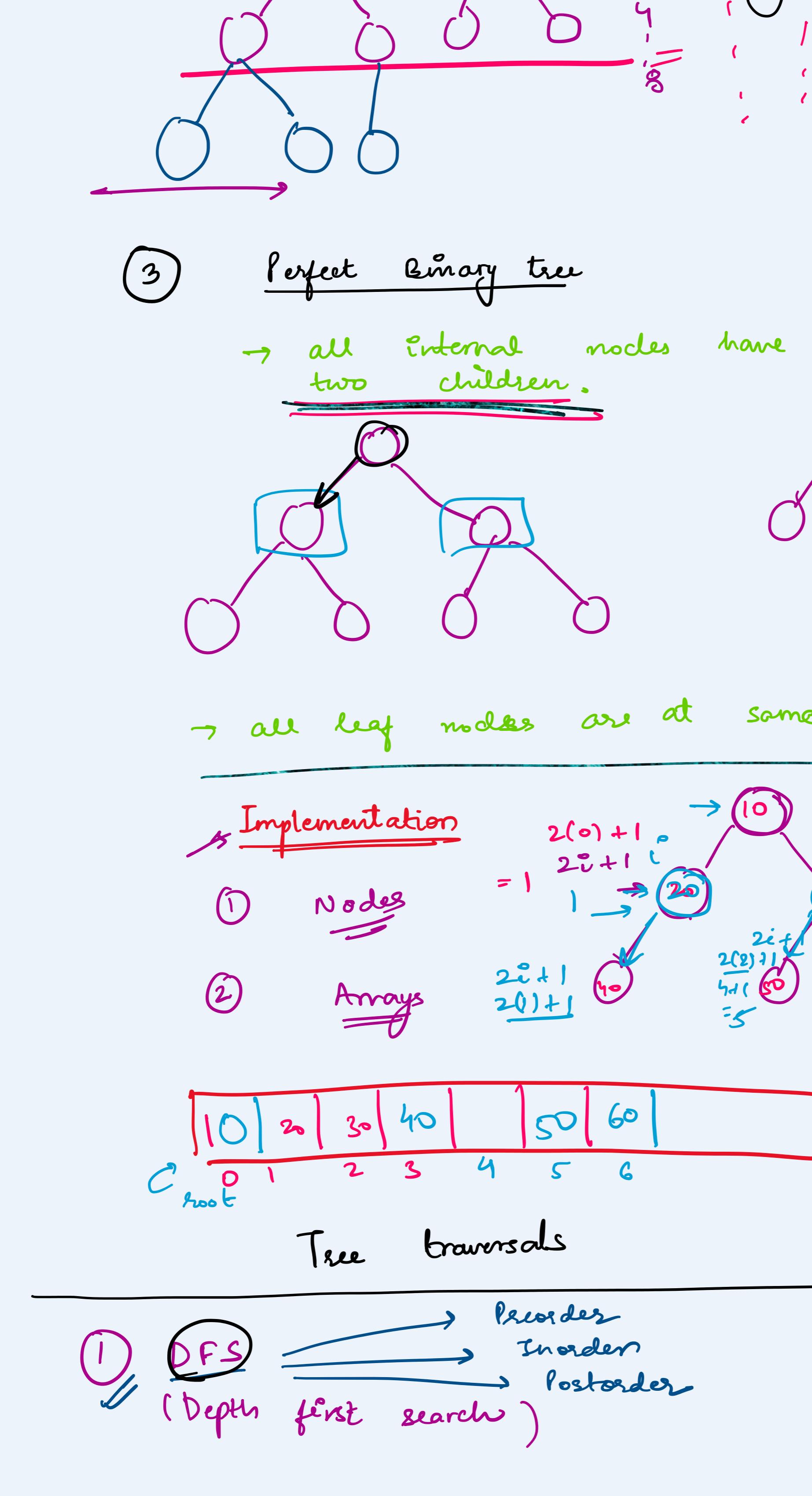
[Trees]

Recursive data structure

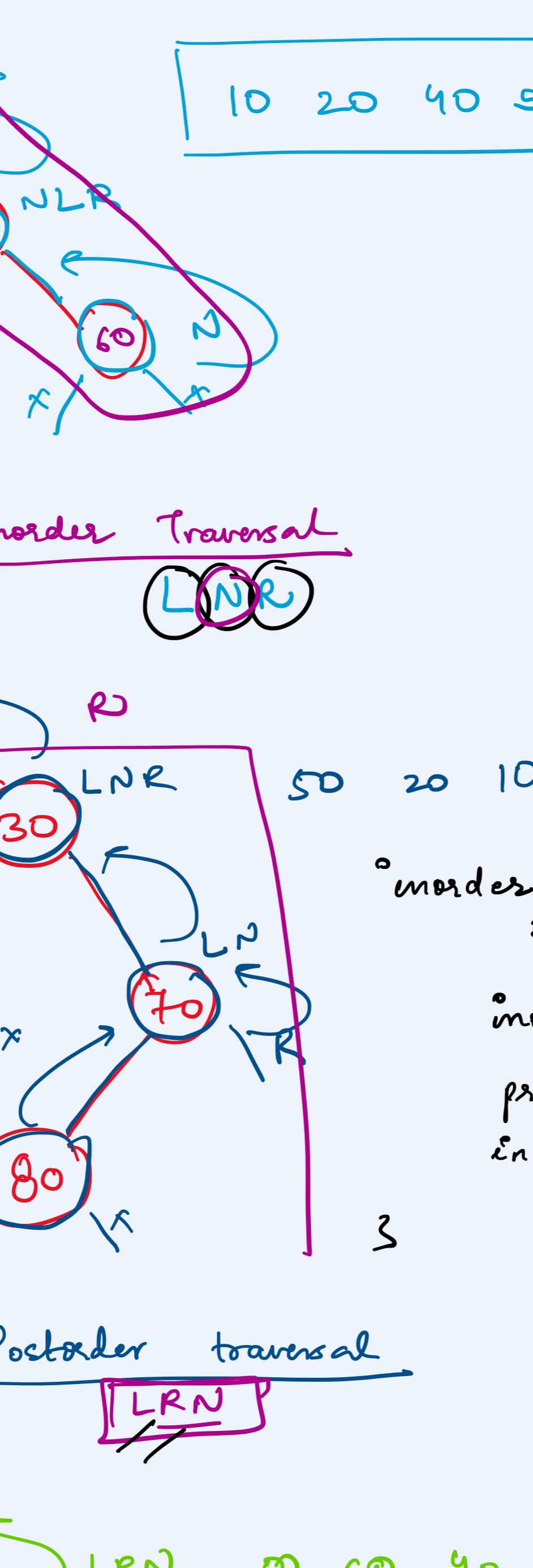
**Each** node of the Tree can have almost 2 children. [Binary tree]



① Depth  
② Height  
③ Level → Depth + 1

① Full Binary Tree

either zero children or two.



→ all leaf nodes are at same level

Implementation

(1) Nodes

(2) Arrays

=  $2^{(l-1)} + 1$ =  $2^0 + 1$ =  $2^1 + 1$ =  $2^2 + 1$ =  $2^3 + 1$ =  $2^4 + 1$ =  $2^5 + 1$ =  $2^6 + 1$ =  $2^7 + 1$ =  $2^8 + 1$ =  $2^9 + 1$ =  $2^{10} + 1$ =  $2^{11} + 1$ =  $2^{12} + 1$ =  $2^{13} + 1$ =  $2^{14} + 1$ =  $2^{15} + 1$ =  $2^{16} + 1$ =  $2^{17} + 1$ =  $2^{18} + 1$ =  $2^{19} + 1$ =  $2^{20} + 1$ =  $2^{21} + 1$ =  $2^{22} + 1$ =  $2^{23} + 1$ =  $2^{24} + 1$ =  $2^{25} + 1$ =  $2^{26} + 1$ =  $2^{27} + 1$ =  $2^{28} + 1$ =  $2^{29} + 1$ =  $2^{30} + 1$ =  $2^{31} + 1$ =  $2^{32} + 1$ =  $2^{33} + 1$ =  $2^{34} + 1$ =  $2^{35} + 1$ =  $2^{36} + 1$ =  $2^{37} + 1$ =  $2^{38} + 1$ =  $2^{39} + 1$ =  $2^{40} + 1$ =  $2^{41} + 1$ =  $2^{42} + 1$ =  $2^{43} + 1$ =  $2^{44} + 1$ =  $2^{45} + 1$ =  $2^{46} + 1$ =  $2^{47} + 1$ =  $2^{48} + 1$ =  $2^{49} + 1$ =  $2^{50} + 1$ =  $2^{51} + 1$ =  $2^{52} + 1$ =  $2^{53} + 1$ =  $2^{54} + 1$ =  $2^{55} + 1$ =  $2^{56} + 1$ =  $2^{57} + 1$ =  $2^{58} + 1$ =  $2^{59} + 1$ =  $2^{60} + 1$ =  $2^{61} + 1$ =  $2^{62} + 1$ =  $2^{63} + 1$ =  $2^{64} + 1$ =  $2^{65} + 1$ =  $2^{66} + 1$ =  $2^{67} + 1$ =  $2^{68} + 1$ =  $2^{69} + 1$ =  $2^{70} + 1$ =  $2^{71} + 1$ =  $2^{72} + 1$ =  $2^{73} + 1$ =  $2^{74} + 1$ =  $2^{75} + 1$ =  $2^{76} + 1$ =  $2^{77} + 1$ =  $2^{78} + 1$ =  $2^{79} + 1$ =  $2^{80} + 1$ =  $2^{81} + 1$ =  $2^{82} + 1$ =  $2^{83} + 1$ =  $2^{84} + 1$ =  $2^{85} + 1$ =  $2^{86} + 1$ =  $2^{87} + 1$ =  $2^{88} + 1$ =  $2^{89} + 1$ =  $2^{90} + 1$ =  $2^{91} + 1$ =  $2^{92} + 1$ =  $2^{93} + 1$ =  $2^{94} + 1$ =  $2^{95} + 1$ =  $2^{96} + 1$ =  $2^{97} + 1$ =  $2^{98} + 1$ =  $2^{99} + 1$ =  $2^{100} + 1$ =  $2^{101} + 1$ =  $2^{102} + 1$ =  $2^{103} + 1$ =  $2^{104} + 1$ =  $2^{105} + 1$ =  $2^{106} + 1$ =  $2^{107} + 1$ =  $2^{108} + 1$ =  $2^{109} + 1$ =  $2^{110} + 1$ =  $2^{111} + 1$ =  $2^{112} + 1$ =  $2^{113} + 1$ =  $2^{114} + 1$ =  $2^{115} + 1$ =  $2^{116} + 1$ =  $2^{117} + 1$ =  $2^{118} + 1$ =  $2^{119} + 1$ =  $2^{120} + 1$ =  $2^{121} + 1$ =  $2^{122} + 1$ =  $2^{123} + 1$ =  $2^{124} + 1$ =  $2^{125} + 1$ =  $2^{126} + 1$ =  $2^{127} + 1$ =  $2^{128} + 1$ =  $2^{129} + 1$ =  $2^{130} + 1$ =  $2^{131} + 1$ =  $2^{132} + 1$ =  $2^{133} + 1$ =  $2^{134} + 1$ =  $2^{135} + 1$ =  $2^{136} + 1$ =  $2^{137} + 1$ =  $2^{138} + 1$ =  $2^{139} + 1$ =  $2^{140} + 1$ =  $2^{141} + 1$ =  $2^{142} + 1$ =  $2^{143} + 1$ =  $2^{144} + 1$ =  $2^{145} + 1$ =  $2^{146} + 1$